

Claims

1. Method for fault detection in a power transformer/-
autotransformer and/or interconnected power lines that are
5 within a zone protected by a differential protection, the
method being particularly suitable for detecting turn-to-
turn faults in power transformer/autotransformer windings
and including measuring all individual instantaneous phase
currents of the protected object and calculating individual
10 phase currents as fundamental frequency phasors,

the method comprising,

- calculating the contributions of the individual protected
object sides negative sequence currents to the total
negative sequence differential current by compensating for
15 the phase shift of the power transformer within the
protected zone,
- comparing the relative positions of the compensated
individual sides negative sequence currents in the complex
plane, in order to determine whether the source of the
20 negative sequence currents, i.e. the fault position, is
within the protected zone or outside of the protected zone,
delimited with current transformer locations,
- disconnecting the protected object if determined that the
source of the negative sequence currents is within the
25 protected zone.

2. Device for detecting a fault in a power transformer,
autotransformer or interconnected power lines, that are
within a zone protected by a differential protection, and
30 particularly suitable for detecting turn-to-turn faults in
power transformer/autotransformer windings, comprising
means for measuring all individual instantaneous phase

28-10-2005

currents of the protected object, and means for calculating individual phase currents as fundamental frequency phasors, **characterized by,**

- 5 - means for calculating the contributions of the individual protected object sides negative sequence currents to the total negative sequence differential current by compensating for the phase shift of an eventual power transformer within the protected zone,
- 10 - means for comparing the relative positions of the compensated individual sides negative sequence currents in the complex plane, in order to determine whether the source of the negative sequence currents, i.e. the fault position, is within the protected zone or outside of the protected zone, delimited with current transformer locations,
- 15 - means for disconnecting the protected object if determined that the source of the negative sequence currents is within the protected zone.

3. Device according to claim 2,
- 20 **characterized by that,**
- a fault discriminator is included, that is arranged to determine when a fault occurs.

4. Device according to claim 2 or 3,
- 25 **characterized by that,**
- a fault discriminator is included, that is arranged to determine if the fault is internal or external.

5. A computer program comprising computer program code means
- 30 for carrying out the steps of a method according to claim 1.

28-10-2005

6. A computer readable medium comprising at least part of a computer program according to claim 4.

5 7. A computer program, according to claim 4, that is, at least partially, provided through a network, such as e.g. internet.